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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/584,330	05/30/2000	Brain Unitt	476-1921	1746

23644 7590 02/23/2005

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EXAMINER	
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ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 02/23/2005

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/584,330
Filing Date: May 30, 2000
Appellant(s): UNITT ET AL.

William M. Lee, Jr.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 15 November 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is deficient because it contains subject matters that are not claimed. For example, the brief states in second paragraph of the summary the overall size of the network and the packet size, and in the last paragraph the relative distance among subscriber stations and head end station.

Following is a correct summary:

The present invention related to a passive optical network arrangement comprising a head-end station and at least one subscriber station. In summary, the invention as presently claimed has subscriber stations arranged to transmit on a common optical frequency distinct from that on which the head-end station is arranged to transmit and arranges each subscriber station to detect whether another of said subscriber stations is transmitting on said common

optical frequency by arranging the PON to provide optical connectivity from each of said stations to each other station but no optical connectivity from each of said station back to itself. Thus, simple collision detection circuitry may be employed at the subscriber stations, since any transmission received by a subscriber station on the common optical frequency during the subscriber station's own transmission indicates collision.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-4, 6, 8-10, 12 and 14-20 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

4,701,909	Kavehrad	10-1987
5,109,448	Coden et al.	04-1992
5,282,257	Ota	01-1994
5,915,054	Ota	06-1999
6,493,335	Darcie et al.	12-2002

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 6, 8-10, 12, 14 and **16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Darcie et al. (U.S. Patent 6,493,335 B1) in view of Ota (U.S. Patent 5,282,257) and Ota (U.S. Patent 5,915,054).

Regarding **claims 1 and 6**, Darcie et al. discloses in FIG. 14B a passive optical network (PON). FIG. 14B comprises a head-end station (CO) 10, a plurality of subscriber stations EU20 (only one is shown in the diagram) and passive optical splitters 15a and 15b for providing connectivity for the stations. FIG. 14B also shows a common optical wavelength $\lambda 1$ for subscribers to send upstream data. Each station comprises receiver (RCV) for detecting when another subscriber station is transmitting. The subscribers receive broadcast data on $\lambda 2$. The difference between Darcie et al. and the claimed invention is that the loop back arrangement of Darcie et al. provides connectivity from each subscriber back to itself. Ota '054 teaches in col. 3, lines 4-21 that by using a coupler such that a signal transmitted from a node will never return to the node, collision detection can be simplified such that if a signal is detected at the receiving port it is determined that a collision has occurred. Ota '054 cites Ota '257 (U.S. Patent Application 07/813,443) for such a coupler. One of ordinary skill in the art would have been motivated to combine the teachings of Ota with the access network of Darcie et al. because the coupler of Ota '257 simplifies the collision detection circuit and makes the detection reliable. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a coupler that provides no optical connectivity from an input port to its corresponding output port and use a simple light detector for collision detection, as taught by Ota, in the access network of Darcie et al. because the coupler of Ota '257 simplifies the collision detection circuit and makes the detection reliable.

Regarding **claims 2-3**, Darcie et al. explains in col. 2, line 54-col. 3, line 12 that the network deploys carrier sense/collision detection (CSMA) and Ethernet protocol.

Regarding **claim 4**, Darcie et al. explains in col. 16, lines 11-19 that the network operates at bit rates of the order of 1 Gbit/s.

Regarding **claims 10, 14 and 17-18**, Ota '054 teaches in col. 3, lines 20-22 that if a signal is detected it is determined that a collision has occurred. That is, a simple light detector can replace the RCV for l1 in FIG. 14B of Darcie et al.

Regarding **claims 8-9 and 16**, FIG. 14B of Darcie et al. is a telecommunications access network.

Regarding **claim 12**, in FIG. 14B of Darcie, EU20 receives both $\lambda 1$ and $\lambda 2$ at a common input port and includes splitter to split $\lambda 1$ and $\lambda 2$.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Darcie et al., Ota '335 and Ota '257 as applied to claims 1-4, 6, 8-10, 12, 14 and 16-18 above, and further in view of Kavehrad et al. (U.S. Patent 4,701,909).

Darcie et al., Ota '335 and Ota '257 have been discussed above in regard to claims 1-4, 6, 8-10, 12, 14 and 16-18. The difference between Darcie et al., Ota '335 and Ota '257 and the claimed invention is that Darcie et al., Ota '335 and Ota '257 do not teach the use of PIN diode for light detection. It is well known in the art that PIN diode and Avalanche photodiode (APD) are commonly used as photodetectors for detecting light signals. For example, Kavehrad et al. teaches in FIG. 1 and col. 8, line 24 a collision detection circuit using APD or PIN diode. One of ordinary skill in the art would have been motivated to combine the teaching of Kavehrad et al.

with the modified access network of Darcie et al., Ota '335 and Ota '257 and use a PIN diode as a light detector because PIN diode is fast and inexpensive. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use PIN diode as light detector, as taught by Kavehrad et al., in the modified access network of Darcie et al., Ota '335 and Ota '257 because PIN diode is fast and inexpensive.

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Darcie et al., Ota '335 and Ota '257 as applied to claims 1-4, 6, 8-10, 12, 14 and 16-18 above, and further in view of Coden et al. (U.S. Patent 5,109,448).

Darcie et al., Ota '335 and Ota '257 have been discussed above in regard to claims 1-4, 6, 8-10, 12, 14 and 16-18. The difference between Darcie et al., Ota '335 and Ota '257 and the claimed invention is in the structure of the passive coupler. Coden et al. discloses in FIG. 2 a passive coupler that has the feature of the instant claims. One of ordinary skill in the art would have been motivated to combine the teaching of Coden et al. with the modified access network of Darcie et al., Ota '335 and Ota '257 because the coupler of Coden et al. has the same feature of Ota that there is no optical connectivity from an input port to its corresponding output port and is much simpler in design and manufacturing. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the passive coupler of Coden et al. in the modified access network of Darcie et al., Ota '335 and Ota '257 because the coupler of Coden et al. is simple in design and manufacturing.

(11) Response to Argument

The Appellant argues on page 6 of the Brief that Darcie teaches away from the present invention and states, "it is a mandatory requirement that each end user station receives back the data it transmits upstream as a traffic information signal". The Examiner disagrees. The claimed invention and the issue here are related to collision detection. Both the claimed invention and Darcie teaches non-scheduled time-sharing a common wavelength over a common network among subscriber stations. In such network, two or more subscriber stations cannot send data at the same time; otherwise a collision occurs and the data are corrupted. When collision occurs, each subscriber station involved in the collision has to wait a random time and resend data. Therefore, the upstream traffic condition must be closely monitored for collision detection (see Darcie col. 17, lines 30-31). Darcie discloses in FIG. 14B an arrangement for monitoring the upstream traffic condition by loop-back, i.e., by connecting an output port of optical splitter 150b to an input port of optical splitter 150a. This is done because it is necessary to monitor the upstream traffic condition (Darcie col. 17, lines 30-31). In particular, it is necessary for a station, while transmitting data, to know whether other stations are also transmitting data. Darcie does not teach the limitation "no optical connectivity from each of said station back to itself" as recited in claim 1. However, nowhere does Darcie teach "it is a mandatory requirement that each end user station receives back the data it transmits upstream". This is only Appellant's conclusion or opinion, which cannot take the place of evidence. See In re Schulze, 52 CCPA 1422, 346 F.2d 600, 145 USPQ 716 (1965); Meitzner v. Mindick, 549 F.2d 775, 193 USPQ 17 (CCPA 1977).

The prior art—Darcie, Ota '257 and Ota '054—as a whole clearly suggests the desirability of the claimed invention, as explained in the grounds of rejection. The fact that Darcie discloses

more than one alternative for detecting collision does not constitute a teaching away. In essence, Darcie does not criticize, discredit, or otherwise discourage solution claimed in application. On the contrary, Darcie realizes that it is unnecessary for a node to receive back information that it has sent. For example, Darcie teaches in FIG. 3A and FIG. 3B that it is only necessary for a node to receive a Traffic Information Signal (TIS) for indicating whether collision has occurred or not. The TIS is a three-level signal for indicating upstream traffic condition. The three levels, 0, low and high, indicate channel idle, channel busy and collision, respectively, as explained by Darcie in FIG. 4B and col. 6, lines 16-28. That is, Darcie does teach the limitation "no optical connectivity from each of said stations back to itself" in another embodiment even through that embodiment differs from claim 1 in other aspect. Since Darcie does not criticize, discredit, or otherwise discourage solution claimed in application, Darcie does not teach away the claimed invention. See In re Fulton, 73 USPQ2d 1141 (CA FC, 2004).

The Appellant then attacks Darcie by saying, "[Darcie] does not address the problem of economy and efficiency in implementing collision detection mechanism in a PON". This is irrelevant since such terminologies are not supported by the claims. Furthermore, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir 1986).

The Appellant argues on the same page that no combination where prior art teaches away from claimed invention. Appellant states, "It is clear as a matter of fact that Darcie requires connectivity from each station back to itself. Without this, none of the embodiments of Darcie

would work." Here Appellant uses a conclusive statement to support his/her argument. No such fact is stated in Darcie.

Finally, the Appellant argues that there is no motivation to combine. The Examiner disagrees. As stated above, the claimed invention and the network disclosed by Darcie are related to collision detection. Ota '257 and Ota '054 disclose a coupler for facilitating collision detection. Ota '054 teaches in col. 3, lines 4-21 that by using a coupler such that a signal transmitted from a node will never return to the node, collision detection can be simplified such that if a signal is detected at the receiving port it is determined that a collision has occurred. Ota '054 cites Ota '257 (U.S. Patent Application 07/813,443) for such a coupler. One of ordinary skill in the art would have been motivated to combine the teachings of Ota with the access network of Darcie et al. because the coupler of Ota '257 simplifies the collision detection circuit and makes the detection reliable. That is, the references themselves provide a strong motivation for combining, and the combination of the references teaches all the limitations of the claims 1-4, 6, 8-10, 12, 14 and 16-18.

Appellant's argument with respect to issues 2 and 3 are based on the arguments of issue 1 and is moot in view of the above.

For the above reasons, it is believed that the rejections should be sustained.

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Respectfully submitted,

skl
February 18, 2005

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